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Using Theory-Based Tools May Increase
Patient Adherence to Fall Prevention Recommendations

Kasa Zipfel

Fall Efforts Fall Short: Are Current Fall Prevention Efforts A Waste?

Adults over the age of 60 comprise the fastest growing population in the world. Current estimates for this demographic of nearly 700 million people project that this age group will number nearly two billion by 2050 (United Nations, 2004). In the United States (U.S.), falls are the number one cause of injury and death for persons over the age of 65 in the United States (Centers for Disease Control and Prevention [CDC], 2008). Falls threaten the well-being of older adults through loss of independence in activities of daily living (ADLs) and instrumental activities of daily living (IADLs), deteriorated social participation (Tinetti & Williams, 1998), and an increased risk for secondary health issues and death (Alexander, Rivara, & Wolf, 1992; Sterling, O'Connor, & Bonadies, 2001). According to the CDC (2015), falls incurred \$34 billion in direct health care costs in 2013. More than one-third of community dwelling adults 65 and older will fall each year (CDC, 2008). As the populations' life expectancy increases, the costs associated with falls are considered a major public health problem (World Health Organization, 2012).

This paper evaluates contemporary research and public health aims to reduce the risk of older adults, concluding that gaps in current research devalue current fall prevention efforts. To date, research highlights physiological and environmental factors that increase fall risk, however, little is known about intrinsic factors that affect older adult's health-related behavior change.

This paper prompts rehabilitation professionals to evaluate the interventions and recommendations they provide, including an understanding of how intrinsic factors affect health-related behavior change and rehabilitation prognosis. An evaluation of theoretically based tools, rooted in the occupational therapy profession, serve as a starting point for rehabilitation professionals to gain insight into intrinsic factors that affect older adult's adherence to fall

prevention recommendations. This paper seeks to begin a dialogue among rehabilitation professionals, evaluating whether current fall prevention efforts require refinement.

Multifactorial approaches address physical and environmental factors, but if these efforts fail to incorporate psychological aspects of health-related behavior change into recommendations, then do these efforts truly represent best practice?

Emphasis on the Physical: Floundering Efforts

Physiological risk factors for falls include balance, strengthening, medication management, vision, hypotension; environmental factors include ambulatory devices and home modifications. In the U.S., the CDC created a tool kit for healthcare providers to treat older adults who are at risk for falls. The Stopping Elderly Accidents, Deaths & Injuries (STEADI) program provides tools for providers and patients, emphasizing risk reduction for physiological and environmental fall risk factors. According to the CDC (2016), adoption of the program by 5,000 health care providers *could* save \$3.5 billion in direct medical costs over a 5-year period. The STEADI program is one of many that provide a comprehensive set of tests and tools for providers to address risk factors for falls (Tinetti et al., 1997; Costello, E., & Edelstein, J. 2008; Feder et al., 2000). This campaign has contributed to public awareness, and healthcare initiatives throughout the country to raise awareness and screening for fall risk factors.

Public health efforts and research have created for tools providers, and public awareness outreach efforts to understand the risk for injury and decreased independence from falls. Despite these efforts, the majority of community-dwelling older adults do not adopt lifestyle and environmental measures to reduce fall risk (Boyd & Stevens, 2009; Cumming et al., 2001; Roe et al., 2008; Shumway-Cook et al., 2009; Yardley et al., 2008; Yardley et al., 2006). Community

dwelling older adults do not adopt home modifications for fall prevention, or consider the benefit of home modifications for aging in place (Cumming et al., 2001; Riggs, 2015).

More than half of falls occur in the person's home (National Institute of Health, 2013). A joint study by University of Southern California and The Hartford Institute exploring Baby Boomers' attitudes about health and aging indicated there is a lack of consideration to future physical and mental capacity alterations to functioning. Of the 40 percent of the Boomers' in the study who definitively anticipated remodeling their homes in the future only 21 percent considered their own health and aging in remodeling plans. The studies' participants prioritized "updating 'dated' rooms" – kitchens and bathrooms top the list – and making their homes more attractive (Riggs, 2015). In a study by Cumming et al. (2001), occupational therapists evaluated older adults' homes, and provided recommendations to reduce fall risk. Nearly half of all recommendations were ignored, with these older adults indicating that they do not believe their risk of falling can be reduced through home modifications (Cumming et al., 2001).

According to Boyd and Stevens (2009), of the roughly 3.5 million older adults who reported falling within three months of being surveyed, few reported making lifestyle or environmental changes to prevent future falls. When designing fall prevention programs older adults' reluctance to behavior change should be considered. Despite the abundance of literature and proven effective interventions to reduce the risk and occurrence of falls, there is considerably less information available about why patients may not follow through with interventions prescribed by rehabilitation professionals.

The limited current research of barriers for patient adherence to fall prevention education include: a lack of understanding implementation of recommendations, a lack of comprehension about how the recommendations reduce fall risk, and a disbelief in the recommendations'

efficacy (Cumming et al., 2001; Shumway-Cook, et al., 2009). Research highlights low levels of adherence to fall prevention recommendations could be remedied with improved education. (Roe et al., 2008; Yardley et al., 2006). If older adults do not perceive their own risk for falls then education efforts for fall reduction disregard patient-centered care. Furthermore lack of consideration for patient adherence devalues the provider's interventions, and misconstrues health service delivery outcomes.

The demographics of an aging population place effective fall prevention recommendations and interventions as pinnacle in global health efforts. Using the U.S. as an example, public health efforts have focused on physical and environmental risk factors to tailor interventions. The lack of patient adherence to interventions paints a poor prognosis in reducing the falls among older adults. Arguably, the notion that patients will uphold medical advice given during a one-time clinical visit or hospital stay is unrealistic. A patient's ability to teach back information during a one-time performance does not correlate to consistent repeated behavior required to establish a habit (Prochaska, 2013). Contemporary fall prevention efforts lack an understanding that successful implementation of interventions begins with the patient's resolve to evaluate and reform their behavior to decrease falls. Fall prevention efforts' emphasis on external factors incongruously assume that patients perceive they are at risk of falling, desire to change their behavior, and readily ascribe to all recommendations to reduce their risk of falls.

The problem of poor adherence to medical interventions and recommendations extends well beyond fall prevention (Blackwell, 1973; Davis, 1971; Fawcett, 1995; Haynes, 1979). In the U.S., non-adherence to medication accounts for between 10-25% of admissions to nursing homes and hospitals, and accounts for 125,000 deaths per year (Smith, 1989). Developments to increase adherence include shifting an understanding toward the patient as an active determinant in the

success of therapy (Tilson, 2004). A narrative review by Atreja, Bellam, and Levy (2005) sought to assist healthcare providers in utilizing proven interventions to increase patient adherence.

They categorized these interventions into categories with the mnemonic “SIMPLE” representing each grouping:

1. **Simplifying regimen characteristics;**
 - a. *emphasizes increased adherence when matching regimen characteristics, such as exercise or medication management, to the patients’ activities of daily living (routine).*
2. **Imparting knowledge;**
 - a. *emphasizes that knowledge dissemination should be robust, providing multiple learning opportunities and mediums, not to confuse one-time demonstration with understanding and comprehension.*
3. **Modifying patient beliefs;**
 - a. *highlights a major downfall in contemporary fall prevention efforts citing evidence-based adherence-enhancing strategies should assess perceived susceptibility, barriers and benefits.*
4. **Patient communication;**
 - a. *emphasizes that including the patient in medical decisions increases adherence (shared-decision making).*
5. **Leaving the bias;**
 - a. *challenges clinicians to tailor education to their patient’s level of understanding.*
6. **Evaluating adherence.**
 - a. *highlights evaluation of adherence as an integral part of best practice to increase an understanding of successful adherence-enhancing strategies.*

As previously stated, many older adults do not *perceive* themselves at risk of falling, and even if identified as “at risk” they may dismiss recommendations based upon their beliefs.

Findings from this study provide further evidence for shared decision-making, and the use of tools to evaluate intrinsic factors that affect patient’s adherence to fall prevention recommendations. This approach leads to the question, *Does a one-size-fits all packet, such as the CDC STEADI kit, really illustrate best practice?* If rehabilitation clinicians fail to evaluate factors that affect patient adherence to fall prevention recommendations than health service delivery outcomes may indicate that these clinicians are ineffective in fall prevention.

Solutions From An Occupational Therapy Perspective

Rehabilitation professionals would better serve this unique niche in improving fall prevention methods through utilizing patient-centered goal setting strategies. Nationally, several states have designated shared-decision making (SDM) as a strategic tool to improve healthcare quality and outcomes, and reduce healthcare related costs (Healthwise, 2016). Section 936 of the Patient Protection and Affordable Care Act (2010) defines shared decision-making as:

A collaborative processes between patients, caregivers or authorized representatives, and clinicians that engages the patient, caregiver or authorized representative in decision-making, provides patients, caregivers or authorized representatives with information about trade-offs among treatment options, and facilitates the incorporation of patient preferences and values into the medical plan.

Use of SDM may assist providers in understanding the patient's self-perception regarding their fall risk.

Utilizing an occupational therapy lens, this paper dialogues about potential screening and evaluative tools for rehabilitation professionals that may assist in creating better outcomes for fall prevention. The tools described promote SDM and highlight the intrinsic factors that affect patient adherence and rehab prognosis. The tools discussed are based in theoretical frameworks, which use intrinsic factors as the foundation for understanding a patient's capacity to guide the goal setting and intervention process, and to employ behavior change.

Identifying Intrinsic Factors: Client Perception & Shared-Decision Making

Review of the research indicates that decreased patient adherence to fall prevention recommendations and interventions lack of the patient perceiving their own risk and susceptibility to falls and are a result of a lack of understanding education and interventions

received for fall prevention (Cumming et al., 2001; Roe et al., 2008; Shumway-Cook, et al., 2009; Yardley et al., 2006). Solutions for rehabilitation professionals to increase older adults' adherence to fall prevention and intervention strategies must include intrinsic factors because they undermine health related behavior change. Utilizing an assessment, such as the Canadian Occupational Performance Measures (COPM), allows occupational therapists insight into the patient's perception of their performance.

The COPM measures a person's self-perception of problems among the realms of self-care, productivity and leisure (Law, Baptiste, Carswell, McColl, Polatajko, & Pollock, 2014). The umbrella of *self-care* in the COPM includes personal care, functional mobility and community management. In practice, occupational therapists ask patients about these aspects of their daily life, helping the person identify performance problem areas. Performance problem areas include activities that the patient *wants* to do, *needs* to do or is *expected* to do but *cannot* do, *does not* do, and is *not satisfied* with the way they do this activity currently (Law et al., 2014). The COPM's theoretical roots in the Canadian Model of Occupational Performance and Engagement establish a person's perception and satisfaction as premises for evaluation of their performance (Polatajko, Townsend & Craik, 2007). The therapist uses this framework to prompt the patient through a self-reported ranking system. The patient ranks self-identified performance problem areas in order of importance to assist with prioritizing goals. Once the patient has identified performance problem areas they are asked to rate these problems on a 10-point scale for performance and satisfaction (Law et al., 2014). This process makes the patient the driving force in goal setting. This assessment requires the patient to reflect on their goals, thereby promoting SDM. SDM occurs when a healthcare provider, patient and involved caregivers and family members collaborate to make healthcare decisions in the best interest of the patient

(Agency for Healthcare Research and Quality, 2014). The COPM draws the patient into the act of SDM by requiring that they reflect on their own perception of struggles to assist in establishing mutual goals between patient, provider and caregiver and/or family member.

For persons who are at risk for falling, or have a history of falls, using the COPM could establish whether a patient perceives they are at risk for falls. Additionally, this tool could assist rehabilitation professionals in prioritizing interventions based on the patient's goals and perception and satisfaction with performance. Current research has found that use of the COPM increased patient's sense of involvement in goal setting, improved team communication, improved documentation and the ability to articulate outcomes, and assisted in routine use to guide interventions for older adults (Colquhoun et al., 2010; Colquhoun et al, 2012; Wressle, Eeg-Olofsson, Marcusson, & Henriksson, 2002; Wressle, Marcusson, & Henriksson, 2002).

The COPM format of semi-structured interview allows occupational therapists to use this assessment in many different settings. Use of the COPM for older adults at risk for falls may increase adherence to recommendations if recommendations and interventions support the patient's self-identified goals. Even if patients fail to report performance problems with functional mobility, they may identify goals with leisure, community mobility and maintaining independence with self-care. These activity areas open up dialogue between practitioner and patient about interventions that may increase strength, endurance, balance, or interventions that adapt the environment to increase safety and independence, such as home modifications. Additionally, understanding the patient's social supports and functional mobility assists with determining the patient's prognosis for adherence to fall prevention recommendations. For example, if a doctor refers a patient to a group exercise class or another specialist, the patients' ability to drive or obtain transportation directly correlates to the likelihood of adhering to this

recommendation. Understanding these factors is necessary in order to determine a patient's prognosis for adherence to interventions and recommendations.

Intrinsic Factors for Behavior Change

Understanding mental flexibility, self-efficacy (personal causation) and volition (motivation) assist occupational therapists in establishing a person's rehabilitation prognosis. Mental flexibility, sometimes referred to as cognitive flexibility, refers to a person's ability to adapt their thought patterns to changing demands in the environment (Canas, Quesada, Antolí, & Fajardo, 2003). Personal causation refers to the degree in which a person comprehends his/her own capabilities. It is interchangeably used with the terms self-efficacy or competence (Bandura, 1977; Kielhofner, 2008; Koring et al., 2012). Volition, also referred to as motivation, describes a person's desire to engage in an action or activity that correlates to desired achievable outcomes across contexts (Kielhofner, 2008).

Establishing mental flexibility assists occupational therapists in understanding a person's receptivity to education and treatment interventions. For example, if a patient in inpatient rehabilitation with post-total hip replacement refuses to use assistive devices for lower body dressing, an occupational therapist will tailor therapy interventions and recommendations based on the person's unwillingness to mentally adapt to their post-op capabilities. This mental *inflexibility* assists with intervention, and informs rehabilitation prognosis and discharge planning. In the field of occupational therapy, an emphasis on client-centered care assists in addressing the challenges of mental *inflexibility*. This is particularly important for older adults as the process of mental *inflexibility* occurs when an individual repeats ineffective actions and responses in situations, despite cognitive understanding that these approaches are ineffective.

Several studies linked adoption of health related behavior change with self efficacy, including dieting, physical exercise, dental hygiene, seat belt use and breast examination (Conner, & Norman, 2005; Luszczynska, & Schwarzer, 2005). High self-efficacy correlates to an increased prognosis in following through with exercise routines, whereas low self-efficacy decreases a person's belief and follow-through with exercise routines.

Tools used by occupational therapists based in the Model of Human Occupation (MoHO) and Occupational Adaptation Theory may enhance fall prevention recommendations and interventions through evaluating the intrinsic factors of mental flexibility, personal causation and volition. The Occupational Case Analysis Interview and Rating Scale (OCAIRS) and the Model of Human Occupation Screening Tool (MOHOST) were developed based on theoretical assumptions of the MoHO. These assumptions correlate a person's volition, habits and patterns of engaging in activities, skills and abilities, and environment to their ability to engage in needed and desired activities. These screening tools, with their emphasis on volition and routine provide insight into a person's history and capabilities for behavior change. OCAIRS and MOHOST utilize a semi-structured interview format that solicits an understanding of intrinsic factors that affect performance. Their benefit lies in providing clinicians with a theoretically based alternate to informal interviews during the evaluation process. (Haglund, & Forsyth, 2013).

Clinicians are encouraged to develop their own style of interviewing and incorporate the aspects of the OCAIRS as a natural conversation, tailoring to the circumstances and personality of the client. The advantage of using the OCAIRs in lieu of an informal interview lies in its ability to paint a better picture for rehabilitation prognosis. For example, the questions comprising the OCAIRS evaluate the interplay among a client's habits, routines and motivation as underlying factors for their participation in activities. Beyond measuring whether or not a

client *can* complete an activity, the OCAIRS illuminates whether a client *wants* or *needs* to complete an activity (Haglund & Forsyth, 2013). According to Lai, Haglund and Kielhofner (1999), the process of validating the OCAIRS illustrated that a person's identity relies less on a disability alone, but rather on the continuation of a person's ability to maintain competency in their patterns of engaging in activities and routines.

The strength of the MOHOST is that it paints a clear picture of personal causation, habituation and environment, thereby drawing out components that affect a person's prognosis and rehab potential (Parkinson, Forsyth, & Kielhofner, 2004). Recommendations of evidence-based activities and explanations of their benefits improves adherence to prescribed treatment programs for older adults. This process includes establishing volition levels for participating in specific activities. Pritchard et al. (2014) identified that understanding a patient's volition levels should be an integral component for rehabilitation professionals working with older adults.

Additionally, understanding the likelihood that a person will adopt fall prevention recommendations into their routine should be established. Occupational therapists, operating through the theoretical framework of MoHO, establish the components of a person's routine and habits during their evaluation of a patient. When ascribing a home exercise program, occupational therapists that seek to link exercise to daily functional activities increase a patient's likelihood of incorporating these exercises into their routine.

Pairing of fall prevention interventions and recommendations with routine may increase the likelihood of patient adherence. Medication management, which directly correlates to increased or reduced fall risk among older adults, exemplifies the relationship between routine and adherence. Research by Ruppar and Russell (2009), and Tordoff, Simonsen, Thomson and Norris (2010) discovered that community-dwelling older adults commonly use daily routines for

managing medications. A sample of more than 500 older adults in Australia indicated that routine was the strongest influence for adherence to medication management (Tordoff, Bagge, Gray, Campbell & Norris, 2010). As is the case with medication management, exercise and use of environmental modifications, such as a grab bar, require consistency in effort and a change in routine. Rehabilitation prognosis for adherence to these interventions must incorporate health-related behavior changes that use pre-existing routines and habits to increase likelihood of success and sustainability.

Identifying Intrinsic Factors: Lack of Understanding Education and Interventions

The Relative Mastery Measurement Scale (RMMS) is based in Occupational Adaptation Theory, and could assist with understanding patient's perception of understanding fall prevention interventions and recommendations. A focal point of this theory is the emphasis on the client's active role in selecting occupational challenges and activities for the intervention process as well as the client's self-evaluation of their performance in these activities (George, Schkade, & Ishee, 2004). Two critical underlying assumptions of this theory are that all humans aspire to be competent in "occupational functioning," and that all individuals evaluate their responses to daily challenges through a reflection of his/her sense of relative mastery. A relative mastery assessment entails a review of an individual's sense of his or her own effectiveness, efficiency, and satisfaction to self and others (George & Krusen, 2016, under review). In the occupational therapy profession, RMMS has the potential to increase patient participation in the rehabilitation process through self-directed activity choice, thereby increasing rehabilitation prognosis. The RMMS' emphasis on self-assessment informs the patient and therapist about mental flexibility and performance expectations.

The RMMS could assist with fall prevention efforts through allowing the patient to select the task or most important part of intervention they would like to focus on. Meaningful tasks chosen by the patient increases rehabilitation participation, prognosis and generalization of outcomes (Jackson & Schkade, 2001). The RMMS is quick to administer, roughly 5 minutes, and allows occupational therapists to reflect with a patient about their performance during an activity. It measures the domains of satisfaction, efficiency and effectiveness. In relation to fall prevention, the RMMS provides an opportunity for patient and provider to reflect on the intrinsic factors that affect a person's performance, and subsequent willingness to follow through with an intervention or recommendation. The RMMS offers the practitioner insight into a patient's mental flexibility. For example, if a patient consistently rates their satisfaction and efficiency as low with an activity than this may indicate a level of mental *inflexibility*.

In the field of occupational therapy, evaluating a person's volition, personal causation and mental flexibility allows practitioners to tailor interventions and recommendations in congruence with a patient's intrinsic factors. Use of OCAIRS and MOHOST provide a platform to couple recommendations and interventions into a patient's habits and routines, increasing likelihood of adherence. Use of the RMMS in an inpatient setting, coupled with the Functional Independence Measure (FIM) for patients post-hip fracture decreased the average length of stay by 3.45 days (Jackson & Schkade, 2001). This illustrates increased patient participation in the rehabilitation process, and resulting improved functional outcomes through employing SDM. Use of the COPM with the FIM has been shown to enhance accuracy in prediction of outcomes for rehabilitation services for adults in physical disabilities settings (Simmons, Crepeau, & White, 2000). Additionally, the COPM, OCAIRS, MOHOST and RMMS are evidence-based and provide more robust data measurements for outcome monitoring.

Summary

Utilizing SDM in the goal setting process assists rehabilitation professionals in determining a patient's perception of their risks. Even if patients do not report fall prevention as a goal, SDM assists in targeting mechanisms that may contribute to fall risk factors.

Understanding patient's self perception, mental flexibility, volition, self-efficacy and routines assists rehabilitation professionals in tailoring intervention planning and recommendations. Tools rooted in an understanding of intrinsic factors and behavior change, such as the RMMS, OCAIRS, MOHOST and COPM could provide effective interventions in fall prevention for older adults through:

- providing the patient a voice in the intervention and recommendation process (SDM)
- understanding intrinsic factors that affect rehabilitation prognosis
- providing insight as to whether a remediation or adaptation approach is appropriate (or mixture of both)
- creating cost effective treatment plans
- providing more outcome monitoring measures
- improve the outcome of fall prevention initiatives

This paper challenges clinicians to utilize evidence-based tools to understand the intrinsic factors that affect prognosis for adherence to fall prevention recommendations. Is it realistic to provide instruction for fall prevention recommendations and expect repeated and routine behavior change? Is it appropriate to prescribe health-related behavior change in the same manner that we prescribe medications, expecting patients to readily integrate these changes into their daily routine?

Current research illustrates positive correlations of adherence to fall prevention recommendations when older adults possess a greater understanding of the benefits of these recommendations (Gibson et al., 2010). Using SDM for goal setting, and establishing the patient's beliefs, attitudes, self-efficacy and volition towards fall prevention recommendations

provides an evidence-based foundation for tailoring recommendations and increasing the likelihood of patient adherence. The SIMPLE mnemonic spelled out proven methods to increase patient adherence to treatment recommendations. Using examples from occupational therapy theories, tools and concepts, this paper seeks to arm rehabilitation professionals with tools to enhance fall prevention efforts. If rehabilitation prognosis and patient adherence do not guide future fall prevention interventions and recommendations, then fall prevention efforts for the growing population of older adults provide very little assistance in deducing fall-related costs. This devalues the role that rehabilitation professionals play in fall reduction, and illustrates a disservice in promoting quality of life for older adults.

Conclusion: Implications for Practice

Effective fall prevention efforts require understanding the intrinsic factors that elicit behavior change in older adults. Current research illustrates that many older adults do not perceive themselves as “at risk” for falls. In an era that emphasizes quality healthcare services it is important to incorporate the patient’s perspective in recommendations and interventions. If fall prevention efforts are to be effective then understanding the likelihood of a patient’s adherence to recommendations and interventions is critical. Astreja, Bellam, and Levy (2005) conducted a qualitative synthesis of the literature regarding patient compliance. They summarized strategies into six broad categories using the mnemonic term ‘SIMPLE’. These include simplifying regimen characteristics; imparting knowledge; modifying patient beliefs; patient communication; leaving the bias; and evaluating adherence. The authors conclude with recommendations for health professionals to a variety of ‘SIMPLE’ strategies as best suits the needs of the patient. Customized, evidence-based, client-centered assessment establishes professional-patient partnerships necessary for better adherence, greater satisfaction, and improved outcomes.

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